REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 3-20 are presently pending in this application, Claims 10-19 having been withdrawn from further consideration by the Examiner, Claims 1 and 2 having been canceled, Claims 3-9 having been amended, and Claim 20 having been newly added by the present amendment.

In the outstanding Office Action, Claims 1-4 were rejected under 35 U.S.C. §102 as being anticipated by Eda et al. (U.S. Patent 5,747,857); and Claims 5-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Eda et al.

Claims 3-9 have been amended and Claim 20 has been newly added herein. These amendments and addition in the claims are believed to find support in the original specification, claims and drawings, for example, original Claims 1, 2 and 7. Hence, no new matter is believed to be added thereby.

Briefly, Claim 3 as currently amended is directed to a crystal unit including a crystal blank for a vibrator, a reinforcing plate comprising a quartz crystal plate or a glass plate and having a through-hole, a pair of excitation electrodes, one excitation electrode being formed on one of two major surfaces of the crystal blank, and the other excitation electrode being formed on the other major surface of the crystal blank, the excitation electrodes corresponding to location of the through-hole, and extending electrodes that extend away from respective excitation electrodes. *The crystal blank and reinforcing plate are joined at an entire peripheral portion of the crystal blank by direct bonding,* and an Si-O-Si chemical bond is formed between the crystal blank and reinforcing plate as the direct bonding. Claim 4 as currently amended is also directed to a crystal unit but includes a crystal blank for a vibrator, a reinforcing plate comprising a quartz crystal plate or a glass plate and having a through-hole, a pair of excitation electrodes, one excitation electrode being formed on one of

two major surfaces of the crystal blank, and the other excitation electrode being formed on the other major surface of the crystal blank, the excitation electrodes corresponding to location of the through-hole, and extending electrodes that extend away from respective excitation electrodes. *The crystal blank and reinforcing plate are joined at an entire peripheral portion of the crystal blank by direct bonding,* and an Si-Si chemical bond is formed between the crystal blank and reinforcing plate as the direct bonding. By providing such a reinforcing plate, no stress is applied to the crystal blank upon the change of ambient temperature since the thermal expansion coefficient of the reinforcement plate is substantially equal to that of the quartz crystal blank, thereby effectively maintaining the resonant frequency of the quartz crystal blank constant. Furthermore, *because the entire peripheral portion of the crystal blank of, for example, AT-cut, is directly bonded to the reinforcement plate comprising a quartz crystal plate or a glass plate, the mechanical strength of the crystal unit is significantly improved and the mass production of the crystal units can be facilitated more efficiently.*[1]

Eda et al. disclose electronic components having high frequency elements. However, as discussed in Response filed in December 29, 2003, Eda et al. are not believed to teach "a reinforcing plate comprising a quartz crystal plate or a glass plate and having a through-hole, *wherein said crystal blank and said reinforcing plate are joined at an entire peripheral portion of said crystal blank by direct bonding*" as recited in amended Claims 3 and 4 (emphasis added in italic). Specifically, Eda et al. are not believed to disclose or even suggest that all the peripheral portion of the quartz crystal blank be directly bonded to the reinforcement member made of the quartz crystal plate or glass plate. Examples 36 to 42 in Eda et al. disclose a quartz substrate which is *bonded to a holding member made of quartz crystal at only one end of the quartz substrate.* In other words, the quartz substrate is held by the holding member in a single-beam manner. Examples 43 and 44 in Eda et

[1] See, for example, Specification, page 5, line 23, to page 8, line 12.

al. disclose a rectangular quartz substrate which is bonded to a glass substrate for holding the quartz substrate, but as shown in FIGS. 37 to 57 of Eda et al., the quartz substrate is *bonded to the glass substrate at only three sides of the quartz substrate. Therefore, Eda et al. are not believed to disclose the entire peripheral portion of a crystal blank being directly bonded to the reinforcement member.*

Based on the above discussions, the structures recited in amended Claims 3 and 4 are believed to be distinguishable from Eda et al. and because Eda et al. do not discloses the reinforcing plates as recited in amended Claims 3and 4, the crystal units recited in Claims 3 and 4 are not anticipated nor rendered obvious thereby.

For the foregoing reasons, Claims 3 and 4 are believed to be allowable. Furthermore, since Claims 5-9 and 20 ultimately depend from either Claim 3 or 4, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 5-9 and 20 are believed to be allowable as well.

Applicants also wish to point out that the specific combinations of the crystal blanks and reinforcing plates recited in dependent Claims 5-9 and 20 provide additional advantages attributable thereto. For example, regarding Claims 5 and 6, the combination of the crystal blank made of an AT-cut quartz crystal and the reinforcing plate made of a Z-cut quartz crystal affords increase in etching speed and improvement in productivity when the through-hole is formed in the reinforcing plate by, for example, hydrofluoric acid.[2] Regarding Claims 7 and 20, the combination of the crystal blank made of an AT-cut quartz crystal and the reinforcing plate made of an AT-cut quartz crystal permits each extending electrode be led out on, of the side surface of the through-hole, an inclined surface oblique to a crystallographic Z' axis of the quartz crystal constituting the reinforcing plate, thereby

[2] See, for example, Specification, page 6, lines 10-18.

preventing breaks in the extending electrode.[3] Regarding Claims 8 and 9, the combination of the crystal blank made of an AT-cut quartz crystal and the reinforcing plate made of a glass plate enables the formation of isotropic inclined surfaces when forming a though-hole by etching and also enables the extending electrode to be led out on an inclined surface, thereby preventing breaks in the extending electrodes.[4] Therefore, the subject matters recited in Claims 5-9 and 20 are not believed to be obvious, but instead are believed to be further distinguishable from Eda et al.

In view of the amendments and discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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[3] See, for example, Specification, page 6, line 19, to page 7, line 2.
[4] See, for example, id, page 7, lines 3-10.